



At *FreshwaterLife* we are constantly striving to bring you the most up-to-date information on topics relating to fresh waters. As always, *Freshwater Matters* brings you news from around the world, as well as a look at some of our recent activities and the freshwater meetings and conferences taking place around the globe. To contribute to *FreshwaterLife* please visit [www.freshwaterlife.org](http://www.freshwaterlife.org).

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## Editorial

*This month's editorial has been written by Dr Ian Winfield of the [Centre for Ecology & Hydrology](#), who discusses alarming trends in Arctic charr populations in the U.K.*

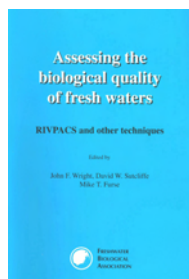


*It is probably not often that a freshwater biologist finds a statistically significant relationship that he or she wishes did not exist, but I have just had this rare experience. Having observed declines in the Arctic charr populations of Windermere and Coniston Water in recent years, I began to wonder if this could be at least in part a manifestation of climate change. Coldwater salmonids such as Arctic charr are obvious candidates to be among the first lake fish species to suffer from elevated temperatures.*

*Working with colleagues from the Centre for Ecology & Hydrology, the Environment Agency and Scottish Natural Heritage, we addressed this question using population trends from sites in England, Scotland and Wales. Our findings were startling in two ways. Firstly, we found that all but one of the 11 populations studied had shown a significant decline in recent years, with the single exception being our most northerly site. Secondly, we found a significant relationship between the degree of population decline and an index of water body vulnerability to climate change calculated as a function of latitude, altitude and mean depth.*

*I would have been much happier if we had found no relationship between our crude measure of vulnerability and local population declines in Arctic charr. After all, this magnificent fish has only just found its way onto the Priority Species List of the U.K. Biodiversity Action Plan and it would be a great pity if we now allow it to disappear off our map.*

## Special offer from the Freshwater Biological Association



Readers may be interested to know about a special offer on the FBA Special Publication 8: "Assessing the Biological Quality of Fresh Waters - RIVPACS and Other Techniques". Originally retailing at £40, SPEC 8 is currently available at £16 - a 60% discount! Copies can be purchased from Amazon by [clicking here](#) or by searching on [www.amazon.co.uk](http://www.amazon.co.uk) for RIVPACS. This offer is open to individuals and institutions so please tell anyone you think may be interested.

## Upcoming events

Here is a short list of freshwater events coming up in the near future. For a more comprehensive list, please visit <http://www.freshwaterlife.org/events.jsp>. If you know of other freshwater events which are not on this list, please add them to FreshwaterLife by logging on and suggesting them under a relevant topic.

**Wetlands in a flood pulsing environment, 1-5 February 2010, Maun, Botswana:** This conference addresses the important effects of pulsing hydrologic cycles on the functioning of wetlands and will focus on inland wetlands and how flood pulses affect wetland chemistry, biological productivity, biodiversity and human livelihoods, history and culture.  
[www.freshwaterlife.org/id/116034](http://www.freshwaterlife.org/id/116034)

**11th River Restoration Conference, 14-15 April 2010, York, United Kingdom:** This conference will aim to broaden the river restoration network and provide a forum for river restoration workers to share their experiences.  
[www.freshwaterlife.org/id/115799](http://www.freshwaterlife.org/id/115799)

**Achieving ecological outcomes: aquatic ecological responses to catchment management, 12-15 April 2010, Windermere, United Kingdom:** Following the success of the inaugural conference in September 2008, the second *Freshwater Biology* summit will be held in 2010, at the FBA's Windermere site in the English Lake District. The conference will tackle one of the most difficult questions in catchment science today: why is it so difficult to achieve good ecological outcomes from integrated catchment management programmes? The speakers have been chosen to highlight new research approaches to understanding the complexities of linked landscapes and waterscapes and to focus discussion around how to move forward on this issue.  
[www.freshwaterlife.org/id/113644](http://www.freshwaterlife.org/id/113644)

## This month's articles

### Light shed on fish gill mystery

Research published in this month's *Proceedings of the Royal Society B* suggest that fish evolved gills primarily to regulate chemical balance and not for the purpose of breathing. Researchers from the University of British Columbia found that as fish larvae mature the gills develop the ability to regulate chemicals in the blood earlier than they take up oxygen suggesting that this could be the role for which they originally evolved.

<http://www.freshwaterlife.org/id/116329>

### Pond life revealed for very first time in Purbeck

The microscopic life of one of the rarest habitats in England is being put under the microscope at the FBA's laboratory in Dorset by scientists from Queen Mary University. In less than two months scientists have found 30 species of invertebrates and 100 different single-celled species. Now with funding from the Esmée Fairbairn Foundation the project partners are launching the Wet Fens Project which aims to incorporate small organisms into wetland conservation.

<http://www.freshwaterlife.org/id/116279>

### Tilapia feed on Fiji's native fish

One of the most important kinds of fish for aquaculture is actually a hugely damaging invasive species according to a new study published by the Wildlife Conservation Society and other groups. In a study on the islands of Fiji researchers found that tilapia are threatening many of the country's native fish species by eating their larval and juvenile forms.

<http://www.freshwaterlife.org/id/116357>

### A giant leap for British salmon

Twenty years of work by angling clubs, local authorities and the Environment Agency have finally paid off with the return of salmon to all the rivers which were affected by the mining industry in South Wales. They were once so polluted that they ran black with mine waste.

<http://www.freshwaterlife.org/id/116375>



Salmon have returned to all affected rivers in South Wales

### Australia's freshwater crocodiles under threat

Australia's freshwater crocodiles are slowly disappearing as they are driven out of parts of Australia's Northern Territory by their larger and more aggressive saltwater cousins. Climate change and eating toxic cane toads could also be factors in the reduction in numbers recorded since the late 1990's.

<http://www.freshwaterlife.org/id/116390>

### Invasive species threaten US biodiversity

As the UN's International Year of Biodiversity begins, the fight against invasive species in the US is heating up. At the forefront of the battle are the country's rivers and lakes where biodiversity has been heavily impacted by the introduction of invasive species.

<http://www.freshwaterlife.org/id/116404>

### The giant Amazon arapaima fish is 'under threat'

The arapaima is one of the world's largest freshwater fish and is being over-fished to the brink of extinction. Although community schemes aimed at managing fishing numbers are having a positive influence on communities, the lack of understanding about the taxonomy of the species means that it may in fact be four separate species, and a lack of management and research means some may be fished to extinction.

<http://www.freshwaterlife.org/id/116419>

### 'Back to nature' cuts flood risks

In research published this month in *Science*, researchers from The Nature Conservancy's Global Freshwater Team advocate large shifts in land use patterns to cope with future flooding and provision of ecosystem services.

<http://www.freshwaterlife.org/id/116429>



Eel numbers have plummeted in recent years

### Thames eel population plunges by 98%

Numbers of the European eel have plummeted by 98% in the River Thames according to the most recent assessment carried out by the Zoological Society of London. Last year only 50 eels were caught as part of the society's monitoring programme, contrasting with 1500 in 2005. The decline is worrying as eels were the first fish to return to the Thames after the river was considered biologically dead in the 1960's and reflect a more widespread reduction in numbers.

<http://www.freshwaterlife.org/id/116442>

### Biodiversity affected by temperature fluctuations

Climate change can have a variety of unexpected effects on ecosystems according to recent work published in *Ecology Letters* which demonstrates that high variation in water temperature can lead to increased biodiversity. Using data from long-term monitoring of plankton populations in 53 lakes across North America and Europe, the research demonstrates that lakes with changeable water temperatures also had the richest diversity.

<http://www.freshwaterlife.org/id/116300>

Please pass this issue on to any of your colleagues who may be interested!

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